

come upon a passage which bears on the history of the diving-bell. Bartolini there writes: "Singulare instrumentum invenit descriptisque Franziscus Kesler Wetzlariensis in secretis suis Oppenheimii editis 1616, capite VI., quod Wasserharnisch vocat, quo tuto ambulemus in fundo maris, legamus ibidem, scribamus, edamus, potemus, cantemus, sine periculo vitæ longiori tempore, omnia pergamus, thesauros eruamus et abscondamus," and so on. Of the two figures one represents the interior—a rough framework of wood, having straps with which the diver secures himself in the bell; the other (see *Wied. Ann.*, No. 5) shows the exterior, an inverted vessel of tumbler shape having five or six small circular windows at the top, while the man's legs project

little below. According to Poggendorff (it is stated) the oldest book in which the diving-bell is mentioned is of 1664, and it refers to a work of Taisnier (as the source of information), the date of which Poggendorff does not give.

WE learn from *L'Électricité* that there is being made near the Palais de l'Industrie a basin, 16 metres in diameter, which will be put at M. Trouvé's disposal for exhibition of his boat driven by electricity. In the centre will be an electric light on a pedestal. At various points within the Palais de l'Industrie will be placed (under the direction of MM. Ranvier, Berger, and Fontaine) models of statues as supports for the electric light in its various forms.

The Municipal Council of Philadelphia has granted to a Company the right to place 3000 kilometres of wire on posts for telephonic purposes. No tax is imposed, but a limit is set to the subscription. The fire-telephones in Berlin have proved so useful, that the municipal authorities are increasing the number. In Paris the development of telephonic lines amounted to 9121 kilometres, the extent of wire being double this.

AN electromagnet of enormous dimensions has lately been made by Herren von Feilitzsch and Holtz for the University of Greifswald. The case is formed of twenty-eight iron plates bent into horseshoe shape, and connected by iron rings so as to form a cylinder 195 mm. in diameter. The height is 125 ctm.; the total weight 628 kilogr. The magnetising helix consists of insulated copper plates and wires having a total weight of 275 kilogr. (For further details see *Les Mondes* of June 23.) With fifty small Grove elements the magnet will fuse in two minutes 40 grammes of Wood's metal in the Foucault experiment. The plane of polarisation is rotated in flint glass after a single passage, &c. The core of the largest magnet hitherto known, that of Plücker, weighed 84 kilogr. and the wire 35 kilogr.

MR. W. MATTIEU WILLIAMS, F.R.A.S., F.C.S., author of "The Fuel of the Sun," "Through Norway with a Knapsack," &c., has been appointed to the management of the Royal Polytechnic Institution, Limited, and will commence his duties at once.

MR. H. C. RUSSELL, Government astronomer, has just sent home his report on the results of rain and river observations made in New South Wales during 1880. In regard to the latter part of the subject Mr. Russell remarks that it seems impossible to doubt that an unlimited supply of water passes away underground, more indeed than would suffice to make the western districts of the colony a well-watered country, and all that is wanted to make the supply available is a judicious use of the boring-rod. The report is illustrated by an interesting rainfall map of New South Wales, and another on which are given curves showing the height of the western rivers during the year.

FOUR shocks of earthquake occurred at Agram on the night of June 22-23; rather severe shocks were felt on June 22 at Bohyhad (10.20 p.m.) and Szegszard (11 p.m.) in Hungary.

A SKELETON of an *Ursus spelæus* was found this week in a cave near Spanheim (Germany).

THE arrangements for the International Medical and Sanitary Exhibition are now complete; the offices are removed from the Parkes Museum to the Exhibition Buildings at South Kensington. The Right Hon. Earl Spencer, Lord President of the Council, has accepted the office of president, and will be present at the opening ceremony on Saturday July 16. The Exhibition is to be complete on Wednesday, July 13, and the judges will make their examinations for the awards on the two days previous to the opening.

IN consequence of the increasingly numerous cases of myopia developed in French schools through bad arrangement of seats and distribution of light, the Minister of Public Instruction has nominated a commission named *De l'Hygiène de la Vue dans les Ecoles*, whose object will be to study the influence of the material conditions of school arrangement on the progress of myopia, and to discover the means of counteracting the evil.

A CAREFUL study of the chief methods in use for the chemical examination of potable water, so far as organic matter is concerned, has been undertaken by order of the U.S. National Board of Health. Medical men throughout the country, and others interested in sanitary matters, have been requested to report to Dr. Mallet of Virginia University any well-marked case of disease from impurities in drinking-water, and to forward samples of such water.

THE additions to the Zoological Society's Gardens during the past week include two Red-handed Tamarins (*Midas rufimanus*) from Demerara, presented by Mr. John Peque; a Stanley Crane (*Tetrapteryx paradisea*) from South Africa, a Common Chameleon (*Chameleon vulgaris*) from North Africa, presented by Mr. J. Sexton; two Laughing Kingfishers (*Dacelo gigantea*) from Australia, presented by Sir Hubert Sandford; a Lead-beater's Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Mr. Martin Smith; a Marsh Harrier (*Circus æruginosus*) from Malta, presented by Mr. J. Wolfe Murray; a Lesser Kestrel (*Tinnunculus cenchris*), South European, presented by Mr. William Brodrick; an Undulated Grass Parrakeet (*Melopsittacus undulatus*) from Australia, presented by the Countess of Ellesmere; two Gerbills (*Gerbillus*, sp. inc.) from Algeria, presented by M. Alphonse Milne-Edwards; a Long-headed Snake (*Xenodon rhabdocephalus*), a d'Orbigny's Snake (*Heterodon d'Orbigny*) from South America, presented by Dr. A. Stradling, C.M.Z.S.; a Red-throated Amazon (*Chrysotis collaris*) from South America, deposited; three Moustache Monkeys (*Cercopithecus cephus*), a Diana Monkey (*Cercopithecus diana*), a Talapoin Monkey (*Cercopithecus talapoin*), two Green Monkeys (*Cercopithecus callitrichus*), a White-collared Mangabey (*Cercocebus collaris*), a Grey-cheeked Monkey (*Cercocebus albigena*), two Water Chevrotains (*Hyomyschus aquaticus*), a Crested Guinea Fowl (*Numida cristata*) from West Africa, a Tamandua Anteater (*Tamandua tetradactyla*), a Peba Armadillo (*Tatusia peba*), a Red-billed Toucan (*Ramphastos erythrorhynchus*) from Brazil; a Hawk's-billed Turtle (*Chelone imbricata*) from the East Indies, a Puff Adder (*Viper arietans*) from Africa, purchased; a Horned Tragopan (*Cerionis satyra*), an Impeyan Pheasant (*Lophophorus impeyanus*), bred in the Gardens.

BIOLOGICAL NOTES

RHYTHMIC CONTRACTION OF VOLUNTARY MUSCLES.—It has been recently observed by Herr W. Biedermann (Vienna Acad. *Sitzungsberichte*) that if the sartorius muscle of a curare-poisoned frog, prepared at a low temperature, be put in a solution of 5 gr. NaCl, 2 gr. Na₂HPO₄, and 0.4 to 0.5 gr. NaCO₃ in 1 litre water, it shows, after a longer or shorter time of rest, rhythmic contractions, which continue regular a certain time for each part of the immersed muscle. Then occur periods of rhythmic contractions, separated by longer or shorter pauses, and often varying in character. These phenomena last a long time; with a coo

external temperature for days. The author saw preparations still pulsating strongly and regularly on the fourth day. (The liquid, in that case, must be often renewed.) These rhythmic contractions of a voluntary striped muscle, indicating chemical stimulus, awaken special interest, through their similarity to the long-known contractions of the apex of the heart, separated and without ganglia, in blood-serum. The heart-muscles, it is known, are also striped.

THE GORILLA AND THE CHIMPANZEE.—Mr. H. von Koppenfels, who is now engaged in explorations in the Gaboon district of Western Africa, in a letter published in the last number of the *American Naturalist*, states that he has good evidence of the existence of crosses between the male gorilla and the female chimpanzee. "This," he says, "settles all the questions about the gorilla, chimpanzee, Kooloo-Kamba, N'schigo, M'bouvé, the Sokos, Baboots, &c." Herr v. Koppenfels observes that the "French savants seem to have a special predilection for creating new species from variations in the form of the skull, such as often occur in this group of animals. There is but one district which forms the range of the gorilla, and this is situated in the western part of Equatorial Africa, and here it exhibits no varieties, while the chimpanzee is found all over Tropical Africa, and naturally exhibits considerable variation. The chimpanzee of Northern Guinea differs essentially from that of the southern portion of the same country, and, according to Livingstone, the 'Soko' differs from both, but is still a chimpanzee. Du Chaillu's Kooloo-Kamba, N'schigo, and M'bouvé are not distinct species, and this traveller, who is certainly a man of merit, but is too credulous, has been imposed upon by the mendacity of the natives, which beggars description. The names N'schigo, M'bouvé, Koola, Baboo, Soko, Quia, and Kooloo-Kamba are only different designations of the chimpanzee by different tribes. The mongrel progeny of the male gorilla and female chimpanzee discovered by me is found but in individual cases, and as such deserves no special name."

SALIVARY GLOBULES.—Prof. Stricker of Vienna, by examination of salivary globules under high-power lenses (obj. No. X. of Kraft and Seivert), has obtained the following results:—He cannot accept the supposition of a so-called Brownian (molecular) movement in salivary corpuscles. He has found the globules to consist of a complete, distinctly visible network. The granules, which have been seen under low powers of the microscope, appear on close inspection and carefully focussing to be thickened points of intersection of the threads forming the reticulum. There is a permanent fluctuation of the threads during the life of the corpuscle. By the action of concentrated salt-solutions the fluctuation ceases gradually and the reticular arrangement disappears.

FISH MORTALITY IN THE GULF OF MEXICO.—From time to time since 1844 a widespread destruction of all sorts of marine creatures has occurred along certain well-marked-out tracts in the Gulf of Mexico. In 1854 the fishes suffered all along the southern shore; in 1878 there was again an excessive mortality; in 1879 the plague again appeared; while in 1880, we learn from the recently-published report of Inspector Ingersall to Prof. S. F. Baird, it has been very intense. The poisoned waters occur in streaks or patches, sometimes near to one another, at other times many yards apart. These seem to drift with the flow of the tide, and ultimately become diluted. The most probable solution of this strange phenomenon is to suppose that eruptions of noxious volcanic gases arise through the bottom of the sea; certain it is that the marine life on the sea-bottom suffers first. Sponges, sea-anemones, mollusks, and the ground fish die in mass, and apparently at once. Upwards the deadly pestilence mounts, and the small fish swimming at or near the surface are killed by thousands, and float lifeless on the water. The large surface fish would seem to escape, and rarely is a mullet to be found destroyed. Fishing in such districts has to be abandoned, even although in the pure streaks the fish abounded, for should a smack fill its well with the results of a successful catch it had to run the gauntlet of the broad patches of the poisoned waters, and if any of these were encountered, and entered the well, a few moments would suffice to bring about the death of every fish in the cargo. The keeper of the Egmont Lighthouse writes on February 21 in this year: "As the tide came in on October 17, 1880, there were thousands of small fish floating on the water, most of them quite dead. The next day the fish were dying all along the shore; between October 25 and November 10 the stench was so horrible that it was impossible to go on the beach.

Sending my family to Manatee, the assistant-keeper and myself shut ourselves up in our rooms, and kept tar, coffee, &c., burning day and night in order to stand it. The peculiar smell was like bilge-water. The fish I noticed dying acted as if crazy, darting around in every direction, then giving up and floating ashore. After a very heavy gale from the south-west the bad and good waters got mixed up, and soon all the fish caught were fat and nice." As the cause of this strange phenomenon is still problematical, some discarding the idea of the evolution of subterranean gases, believing it to be the result of a poisoning of the waters by an excess of rain-water discharged into the Gulf by the rivers, others that it is owing to the water being saturated with the tannin derived from decomposing roots and stems of palmetto, sumach, oak, &c., it would seem highly desirable that Prof. Baird should institute a series of observations as to the chemical constituents at different times of the waters of these districts.

ON THE NECTAR-SECRETING GLANDS IN SPECIES OF MELAMPYRUM.—The cow-wheats are a familiar group of plants, of which several species are to be found native. E. Ráthay, while investing the subject of the secretion of sugar by plants, was attracted by the appearance of swarms of ants evidently collecting some sweet material from the little dark puncta on the bracts of *Melampyrum arvense* (purple cow-wheat). These puncta, even under a hand-lens, are seen to be little round disk-shaped bodies, which proved to secrete a sugary secretion for which the ants came. In a memoir on this subject these gland-like disks are described and figured as they occur in *M. arvense*, *M. nemorosum*, *M. pratense*, and *M. barbatum*. These bodies have long since been observed by the systematic botanists; they form part of the trichomic development of the epidermal system of the bracts, and may be described as consisting of a short foot-cell, attached to the centre of which is a circular disk. This latter is composed of a single layer of seven-sided cells. According to their function these structures in the species of *Melampyrum* mentioned belong to the epidermal glands of De Barry, since they secrete upon the upper side of their disk, between the cuticle and cell-membranes of the seven-sided cells, a liquid which, through the bursting of the cuticle, gets out, and is sought by the ants and eaten. The secreted fluid contains at least 2 per cent. of a kind of sugar which is not reducible by oxide of copper. The history of the development of these structures is practically the same as that of other similar formations. The purpose which they serve to the *Melampyrum* would seem neither to be explained by the hypothesis of Belt and Delpino as to the meaning of the extra floral nectaries, nor according to the hypothesis of Kerner concerning the same. Ráthay further adds that the moistness which almost always appears over these structures is quickly, on removal, renewed; that this moistness increases so much as to form drops when the plants are protected from the approach of ants, &c.; and that this drop-formation is repeated several times if the drops are from time to time removed (Vienna Academy *Proceedings*, vol. lxxxi. 1880).

CHEMICAL NOTES

M. RAOULT states in *Compt. rend.* that the oxides of barium, strontium, and calcium rapidly absorb carbon dioxide at a high temperature: much heat is evolved in the reaction, the temperature of the mass in the case of barium oxide being as high as 1200°, according to a pyrometric determination.

MM. CAILLETET and HAUTEFEUILLE have determined the densities of liquid oxygen, nitrogen, and hydrogen (*Compt. rend.*) by liquefying these gases mixed with carbonic anhydride and with nitrous oxide, and basing their calculations on the assumption that the mixed liquids are without action on one another. The density of liquid oxygen at -23° (pressure = 300 atmos.) was found to be 0.89 from experiments with carbonic anhydride, and 0.94 from experiments with nitrous oxide: at 0° the numbers obtained were 0.58 and 0.65 respectively. Liquid nitrogen at -23° gave numbers corresponding with the density 0.44, while at 0° the density was 0.37. The density of liquid hydrogen was 0.033 at -23°, and 0.025 at 0°. Dividing the atomic weights of the three elements by the densities at -23°, the atomic volume of oxygen is found to be 17, of nitrogen 31.8, and of hydrogen 30.3.

HERR O. LÖW describes experiments with fluorspar from Wölsendorf (*Berliner Berichte*), which seem to show that the liquid contained in the cavities of this mineral consists of free